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Hardware-Centric Quantum Computing for Noisy Systems

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Abstract: Improvementsin the availability and size ofquantum information processing platforms motivateshybrid classical-quantum computing methods whichrely onnoisy intermediate scale quantum (NISQ) devices. In contrast to fault tolerant computing, which abstracts awaymanyimplementation details, NISQ computing may benefit from a detailed understanding ofanalog dynamics. In this talk, I will present recent work detailing i) the characterization of Hamiltonian dynamics in open quantum systems and ii) the use of Hamiltonian controls to suppress noise sources. An analysis of the potential to improvehybrid algorithmic performance is made in both cases.